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<b>(21) International Application Number:</b> PCT/US90/04979  <b>(22) International Filing Date:</b> 31 August 1990 (31.08.90)  <b>(30) Priority data:</b> 414,901                      29 September 1989 (29.09.89) US  <b>(71)(72) Applicant and Inventor:</b> WASHINGTON, Douglas, L. [US/US]; 10443 Lennox Lane, Dallas, TX 75229 (US).  <b>(74) Agent:</b> WATSON, Harry, J.; Hubbard, Thurman, Turner, Tucker & Harris, One Galleria Tower, Suite 2100, 13355 Noel Road, Dallas, TX 75240-6604 (US).  <b>(81) Designated States:</b> AT (European patent), BE (European patent), CA, CH (European patent), DE (European pa- tent)*, DK (European patent), ES (European patent), FR (European patent), GB (European patent), IT (European patent), LU (European patent), NL (European patent), SE (European patent).		<b>Published</b> <i>Without international search report and to be republished          upon receipt of that report.</i>
<b>(54) Title:</b> COMPACT UNIVERSAL CATHETER ASSEMBLY  <b>(57) Abstract</b>  <p>The compact catheter assembly has a male, female or unisex collecting element releasably interconnected with a disposable containment unit having a liquid impermeable envelope filled with absorbent material and superabsorbent polymer for receiving and absorbing fluid from the urethra. Fluid from the bladder enters the containment unit may have a vent at the interconnecting element and if a layer of superabsorbent polymer absorbing material is present the envelope may be vented. The waste liquid forms an instant non-flowable gel with the superabsorbent polymer. In one embodiment the containment element is a pad held by a panty-like brief. In another embodiment the containment unit is a larger pad supported by the seat of a chair. Yet another embodiment has the containment envelope itself made in the form of a wearable brief. A one-way flow valve at the inlet allows fluid to be received.</p>		

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## COMPACT UNIVERSAL CATHETER ASSEMBLY

CROSS REFERENCE TO RELATED APPLICATIONS

Priority is claimed for common subject matter disclosed in prior application. This application was filed  
5 in the United States on September 29, 1989 as Serial Number 07/414,901 and is a continuation-in-part of my previous United States Patent Application Serial Number 07/217,456, now United States Patent Number 4,886,508, which was filed on July 10, 1989 in the United States Receiving Office as  
10 PCT Application Serial Number PCT/US89/02983.

BACKGROUND OF THE INVENTION1. Field Of The Invention

The invention relates to incontinence devices and more particularly to disposable incontinence devices for  
15 male, female, and unisex application.

2. Background of the Art

The problem of incontinence is an embarrassing plague upon a significant percentage of the adult population including both men and women among its victims. Although  
20 incontinence is not unknown in children it often becomes an increasingly severe problem during the aging process.

Many solutions have been offered to relieve the problem. The most common solution is the provision of an absorbent pad supported in the genital area adjacent the  
25 urethra. Sometimes the urethra is in contact with the pad directly and sometimes the urinary opening receives an internal or external entrapment device which collects waste

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fluid from the urethra and transfers it to a container or leg bag. Discardable diaper-like devices have been used, sometimes a disposable pad has been used, but for the most part incontinence devices are non-disposable.

5           One of the reasons for generally non-disposable incontinence devices is the cost factor which is always important in this field.

          Certainty of collection without fluid leakage is an equally important aspect of the incontinence problem. It is  
10       especially difficult for ladies incontinence devices because there is no readily accessible member with which to make a seal. Comfort is a most important consideration which to a considerable extent is the antithesis of certainty in sealing, particularly for female devices. The more success-  
15       ful is a device for making a seal with the female urethra, the more it hurts in use, particularly with extended wear.

          Capacity is another problem. Even with a leg bag connected to an accumulation device, as in Moss U.S. patent 3,601,125 the wearer must still periodically transport  
20       herself to the restroom whereby the bag can be emptied. This becomes a difficult problem for a non-ambulatory person in a wheelchair at public events, in large crowds of people, as at a ballgame. Whether ambulatory or non-ambulatory, all individuals suffering from incontinence are highly sensitive  
25       and secretive about the problem and consequently do not wish to be obliged to wear special garments or devices which cause an unusual appearance when worn under their usual clothing. These and other problems are solved by the present invention in its various embodiments.

#### 30                           SUMMARY OF THE INVENTION

          The present invention provides a compact catheter assembly for transferring fluid waste collecting in a user's bladder, whether of an intermittent or sudden discharge type, to a disposable waste fluid holding unit proximately  
35       mountable adjacent the natural bladder discharge orifice. In one embodiment it includes a means for collecting fluid waste from a user and delivering the collected fluid to an

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outlet having a releasable interconnecting means in sealed liquid communication with a disposable sealed containment means for holding a quantity of fluid waste. The sealed containment means includes an absorbent means carried within the containment means for distributing and absorbing fluid waste delivered through the interconnecting means and preferably includes superabsorbent polymer in combination with fibrous absorbent fluff absorbent material.

In a first embodiment, the sealed containment means is a generally rectangular-shaped pad having a liquid impervious envelope with spaced apart upper and lower surface panels to accommodate the absorbent means and having sufficient volumetric capacity to accept delivery of a full bladder urination.

The absorbent material is preferably substantially coextensive with the impervious envelope and preferably contains superabsorbent polymer powder or granules in combination with fibrous fluff with absorbing characteristics. The containment means may be supported by a specially modified panty or a brief.

In a second embodiment is a compact catheter assembly for extended use in a sitting position to transfer fluid waste collecting in a user's bladder to a disposable waste fluid holding unit positionable on a surface in at least partial support. In addition to a means for collecting fluid and a interconnect means, it includes a disposable sealed containment means of sufficient volumetric capacity for holding the fluid content of more than one full bladder urination. The absorbent means is carried within the containment means for distributing and absorbing fluid waste delivered through the interconnecting means.

The containment means is a pad having a liquid impervious envelope which is adapted to fit on the seat of a chair or a wheelchair and contains a generally centrally located fluid inlet capable of releasable sealed engagement with the interconnecting means and preferably containing a substantially coextensive layer of fibrous absorbent fluff material coextensive with the impervious envelope in

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combination with superabsorbent polymer powder or granules which form a gel upon contact with waste fluid. The containment means is large enough to absorb the contents of more than one full bladder urination passing through the inlet. The user is raised above the containment unit at least in partial support by means of a separate donut-shaped cushion which acts as a spacer resting on the envelope of the containment means.

In a third embodiment the compact catheter assembly for transferring fluid waste collecting within a user's bladder is a wearable waste fluid holding unit shaped like a panty or brief having a means for collecting fluid waste from the urethra. The disposable sealed containment means shaped in the form of a panty-like brief is wearable by a user, provides support for the collecting means, and has sufficient volumetric capacity for holding the fluid content of more than one full bladder urination. The containment means has a liquid impervious envelope having an inner surface for contact with the user's body and a spaced apart outer surface, the surfaces meeting at a peripheral edge, defining two leg holes separated by a crotch area. The fluid inlet is capable of releasable sealed engagement and fluid communication with an interconnecting means, being located in the defined crotch area. Between the spaced apart inner and outer panel surfaces is preferably a coextensive layer of fibrous absorbent fluff material in combination with superabsorbent polymer powder or granules substantially coextensive with the impervious envelope and positioned between the inner and outer surfaces thereof. As before, the superabsorbent polymer powder forms a gel upon contact with waste fluid. It is always located adjacent the surface panel of the envelope farthest away from the inlet.

The collecting means for any of the above disclosed embodiments are male, female, and unisex. The male collecting means is a thin flexible condom-like sheath tube removably fittable on a male member to form a seal therewith and tapering to form the outlet. The female collecting means is an elongated resiliently deformable body having a

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cover panel with centralized elongate opening for the female urethra, said body having a resilient non-absorbent insert spaced apart from the cover panel, and being resiliently deformable along with said catheter body, said body tapering to form said outlet space below said cover panel. The unisex collecting means may be described as a Foley catheter. It is an elongated narrow tube with distal openings for fluid which internally reaches the bladder through the urethral opening.

A means for venting air is preferably included in one of the interconnecting means releaseably joining the collecting means and the inlet. A means for venting air from the sealed containment means spaced apart from the inlet may be used when the absorbent means includes in combination, superabsorbent polymer. The interconnecting means or the inlet itself may carry a one-way flow valve to allow fluid to enter the inlet but restrict the fluid from exiting the inlet. Such valve may be a reed valve, double cylinder valve, or ball valve.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a perspective view of the first embodiment with a male collecting means;

Figure 2 is the embodiment of Figure 1 positioned on a wearer supported by a brief;

Figure 3 is a cross-section of the unit shown in Figure 1;

Figure 4 is a plan view of the underside of the unit of Figures 1 and 2 having Velcro strips;

Figure 5 shows the containment means of Figure 1 in perspective and fitted with a female collector;

Figure 6 shows the unit of Figure 5 in position for use and supported by a special panty-like brief;

Figure 7 is a cross-section through the female collection means of Figure 5;

Figure 8 is a cross-section through the sealed containment means showing absorbent means, including a well defined layer of superabsorbent polymer powder;

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Figure 9 is a perspective view of the containment means of Figure 1 equipped with a Foley catheter;

Figure 10 is a cut-away of the inlet and interconnect having a double cylinder valve;

5        Figure 11 is a cut away of the inlet having a reed valve;

Figure 12 is a cut-away of the inlet and interconnect having a ball valve;

10       Figure 13 is a perspective partially cut-away view of the third embodiment equipped with a female collecting device and a fabric cover;

Figure 14 is a modification of Figure 13 with fasteners at the sides;

15       Figure 15 is a partially cut-away elevation of the second embodiment under a sitting wearer supported on a chair.

Figure 16 is a perspective view of a unit like Figure 1, 5 or 9 further including an air vent in the envelope and having a modified combined inlet and interconnect.

20       DETAILED DESCRIPTION

In the description which follows, like parts are marked throughout the specification and drawings with the same reference numerals, respectively. The drawings are not necessarily to scale, and certain features of the invention  
25       may be exaggerated in scale or shown in schematic or diagrammatic form in the interest of clarity and conciseness.

In Figure 1, the compact catheter assembly unit or catheter unit in operable combination is designated generally by the reference numeral 10. It is equipped with  
30       a means for collecting fluid waste from a male shown in position for use in Figure 2. There is a containment means designated generally by the reference numeral 12 which has a generally rectangular shape. It has an upper surface panel 14 and a lower surface panel 16 spaced apart and opened up  
35       to show absorbent material 18. It has a side surface 20 and another oppositely located side surface 22 which together with the upper and lower surfaces taper into end edge 24 on



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the left side of Figure 1. A similar end edge 26 is seen in Figure 4 opposite end edge 24, which is opened up in Figure 1. Figure 4 also shows that upper and lower surfaces 14, 16 and side surfaces 20, 22 together form a neck portion 28 which is designed to allow some relief in the crotch area between the legs. Containment means 12 is sealed on all surfaces and edges to comprise a liquid impervious envelope. Upper surface 14 may have and fixed thereto a soft fabric layer 30 which serves to improve hand and reduce chaffing. Because the envelope is impervious to liquid the fabric remains dry.

In Figure 3 fabric 30 is seen adhered to upper surface 14 by a layer of adhesive 32. Upper layer 14 and fabric 30 are seen having an upturned portion 34 to form an opening 36 which is sealed around an inlet 38 which extends below the surface 14 through which waste fluid enters the envelope of the containment means. Finally, connector means 40 is carried in sealed fluid communication with inlet 38. The bottom surface of the containment means may have a pair of spaced apart Velcro strips 42 which may cooperate with a corresponding set of Velcro strips on the inside surface of a panty-like brief to removably hold the containment means in correct position for use.

Referring now to Figure 1 and Figure 3 it is seen that connector means 40 has opposed barbed ends one of which is inserted into inlet 38 and the other of which, hidden in Figure 1, is used for releaseably connecting a means for collecting waste fluid, which in Figure 1 is a male collecting means designated generally by the numeral 44. Interconnecting means 40 is a barrel-shaped body supporting the opposed barbed ends with an opening therethrough large enough to pass a full flow urination. It is preferably equipped with an air vent 46 on the side of the barrel shaped body, of the type having a disk which will pass air therethrough but will not allow water droplets to pass through to the outside of interconnect 40. Male collecting means 44 has a thin elastic flexible condom-like sheath tube 48 having an open rolled end portion 50 removably fittable

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on a male member to form a seal therewith and tapering to form an outlet 52 which removably fits over a barbed end of interconnecting means 40. It may also include an accordian section 54 in the tapered portion leading to outlet 52. In Figure 2 the male collecting means is installed on a male member, connected to interconnecting means 40 and containment means 12. It is supported and held in place by brief 56 on a human wearer. Brief 56 may have Velcro strips corresponding to Velcro strips 42 to help hold it in place.

10 In Figures 5 and 7 is seen the containment means 12 of Figure 1, inlet 38 in fluid connection with interconnecting means 40 and female collecting means generally designated as 58. Female collecting means 58 is described in my copending U.S. patent application 217,456 entitled:  
15 "Ladies External Catheter Assembly" filed July 11, 1988 which is incorporated herein by reference. It has an elongated resiliently deformable body 60 having a cover panel 62 with a centralized elongate opening 64 for the female urethra. Held in the body, and in supporting contact  
20 with the walls thereof is a resilient non-absorbent insert 64 of full flow open mesh scrim spaced below the cover panel. The insert allows a full flow discharge from the urethra into the body without splashing. The body itself is of silicone rubber construction with a shape retaining  
25 memory. It is soft and easily compressible but returns to its original shape. It is shown distorted to reveal the insert in Figure 5. Each elongate end of the body 60 has a tapered supporting portion 66 terminating in a T-shaped connector 68. The sides of the body taper to form the  
30 outlet 70 which is releaseably and sealingly connected in fluid communication with interconnecting means 40.

In Figure 7 is a cross-section of female collector 58 which shows the insert 64 in supporting contact with the body and curved in the cross direction and in the longitudinal direction spaced apart below cover panel 62. Elongate opening 63 in cover panel 62 is indicated along with a narrow slit-like extension 74 of said opening which facilitates installing and removing the insert 64. Elongate lip

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65 on cover panel 62 forms the opening 63. Insert 64 is conveniently made from scrim rolled into an elongate tube and flattened with stitches 72 to help hold its shape.

5 The unit shown in Figure 5 is shown placed in position in Figure 6 by means of a panty-like brief 76 having a front flap 78 and a rear flap 80 closest to the wearer's skin and hidden by the outer surface of brief 76. T-shaped connectors 68 pass through slits in flaps 78 and 80 to hold the catheter unit 10 equipped with the female collector 58 in proper position for use. Body 60 should be located approximately horizontal with the wearer in a standing position so that waste fluid emanating from the urethra below the edges of the cover panel may pass through the insert and by gravity, flow through the outlet, inter-  
10 connecting means and the inlet of containment unit 12 which is supported by the lower portion of the panty-like brief. As in indicated in Figure 5 the containment means preferably has a layer of superabsorbent polymer powder or granules 82 which form a gel upon contact with waste fluid. In  
20 combination with fibrous absorbent fluff material 18 waste fluid is distributed within the envelope of containment means 12 and fixed instantly as a gel upon contact with the superabsorbent polymer powder. Because the absorbent material is coextensive with the envelope, waste fluid travels to all parts of the containment means and does not  
25 accumulate in the lowermost portion of the curved arc in which the containment means must reside to conform with the general shape of the genital area in supporting contact with the panty-like brief.

30 Figure 8 shows a containment means 12 having sealed inlet 38 connected to a portion of interconnect means 40 with arrows showing the direction of flow of waste fluid. The structure is the same as Figure 3 except that underlying fibrous absorbent fluff 18 is a coextensive layer of  
35 superabsorbent polymer powder 82 which may also be a series of polymer powder making up layer 82 in combination with sheets of fibrous nonwoven material. Without the layer of superabsorbent polymer shown in Figure 5, the envelope of

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the containment means must be large enough to accommodate absorbent fill material throughout sufficient to absorb and distribute waste fluid by wicking and absorption. In Figure 8 a more compact envelope than that of Figure 3 is seen.

5 The envelope has a thinner cross-section with shorter side panels than the envelope of Figure 3 because the superabsorbent powder will absorb many times its weight of water and instantaneously converts the water into a gel upon contact with the waste fluid. The absorbent material 18 serves to

10 distribute the waste fluid throughout the envelope in contact with the polymer powder which converts it to a gel starting at the centralized opening area and spreading throughout the envelope. When superabsorbent polymer is used it is concentrated under fibrous absorbent material 18

15 spaced away from the inlet so that the absorbent material 18 can distribute fluid and to avoid having the inlet blocked by gel formation which occurs very rapidly when waste fluid contacts the polymer. Both the absorbent material and the superabsorbent polymer are hydrophillic.

20 Figure 9 shows the containment unit 12 with a unisex collector 84 having an outlet 88 connected to interconnecting means 40 and at the opposite end thereof having openings 86 for entrance of bladder contents. The unit works much as before except that the Foley is an elongated

25 hollow tube which is inserted into the urethral opening and reaches into the bladder whereby continuous drainage of fluid from the bladder enters openings 86, travels through the elongated tube to outlet 88 where the fluid enters interconnecting means 40, passes through inlet 38 to enter

30 containment means 12. Containment means 12 has absorbent layers 18, 82 as in Figure 8 and in other respects is like the units previously described. It is likewise held in place by a brief or panty-like brief as indicated by Figure 2 with the catheter inserted as described to collect the

35 waste fluid.

Figures 10, 11 and 12 show one-way flow valves mounted at the inlet which pass full flow discharge of waste fluid in one direction but block flow in the opposite direc-

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tion. Figure 11 shows a reed valve 90 carried by the inlet having an upper stub receiving portion and a lower flattened outlet portion 92 which allows fluid to pass through in the direction of the arrow, the reed valve being of flexible material which closes if subject to outflow pressure caused by fluid moving opposite to the arrow. The rounded upper portion is seen surrounding a portion of interconnect 40 sealed in fluid communication therewith.

Another type of one-way valve is disclosed in Figure 10 which itself can serve as an interconnecting means. It is referred to generally as double cylinder valve 94 having a central body portion 96 having opposed barbed stubs 98 and 100. Barbed stub 100 sealingly and removably engages inlet 38 of containment means 12 and stub 98 removably engages the outlet of any of the male, female or unisex collector means. Fluid flows in a direction of the arrow from the collector means through the combined interconnecting means and one-way flow valve to enter the envelope. The lower portion of stub 98 has an O-ring 102 in contact with an outer cylinder 104 holding a reciprocating inner piston 106. The top of inner piston 106 is beveled to engage the O-ring with the piston in the uppermost flow resisting position. Outer cylinder 104 is urged slightly against the O-ring by weak spring 108. Spring 108 is enough to just barely hold the cylinder 104 in place against the O-ring. When flow in the direction of the arrow encounters the piston 106 it pushes 106 down to stop 110 below which is a series of passages and openings designated as openings 112 which are open to the central opening of stub 100. Outer cylinder 104 reciprocates guided by 90° spaced apart support bars 114 which extend from the wall of central body 96 leaving significant space around cylinder 104. This space is connected to openings 112 and allows full flow through the one-way valve when the piston 106 bottoms in cylinder 104 to move both of them downward against the spring which exposes the openings to the passage of fluid therethrough. Fluid passing in the opposite direction exerts pressure on the bottom of piston 106 which forces it against the O-ring

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to prevent flow moving in the direction opposite to the arrow.

Figure 12 is another one-way flow valve 97 having central body 116 with O-ring 102 and ball 118 urged against the O-ring by another weak spring 120 to prevent flow in one direction opposite the arrow but permit flow in the opposite direction. Ball 118 and spring 120 ride on longitudinal spacer bars located 90° from each other on the inside wall of body 116. Body 116 has opposite barbed stubs 122, 124 for use as before described with a full flow passageway 99 therethrough.

Figure 15 shows as a second embodiment a catheter assembly unit designated generally as 126. Catheter 126 is shown resting supported on chair seat 128. It has a sealed liquid impervious envelope 130 all around which forms an outer perimeter edge 136 which is a generally rectangular or square shape. The envelope has upper surface 132 and lower surface 134. Between the surfaces coextensive with the envelope 130 is absorbent means 18. It may also preferably have superabsorbent polymer layer (82) under a reduced thickness layer of absorbent material 18 as in previous embodiments. As a result the envelope may have a reduced spacing also between the upper and lower surface panels 132, 134. The envelope 130 has sufficient volumetric capacity for holding the fluid content of more than one full bladder urination and may be able to contain two or more depending on how large it is made and how much separation there is between the upper surface 132 and the lower surface 134.

Envelope 130 has a generally centrally located fluid inlet 138 in releasable sealed liquid communication with interconnecting means 40 which may also have air vent 46 to vent air without venting liquid as before described. The unit is shown with a female collector 58 connected in fluid communication without outlet 70 connected to interconnect 40. Absorbent material 18, is substantially coextensive with the impervious envelope and has absorbency sufficient to absorb contents of more than one full bladder urination passing through the inlet. The absorbent material

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could be only absorbent material 18 but also a combination of absorbent tissue or other fibrous absorbent fluff and a layer of gel forming polymer powder 82 which forms a gel upon contact with waste fluid. It may also carry a one-way flow valve for controlling flow of waste fluid into the containment means but preventing outflow that might be caused by pressure. This one-way flow valve would not be necessary if a sufficient layer of superabsorbent polymer is present to gel the fluid content expected for normal use. Once gelled, the fluid waste is fixed and won't emerge from the envelope even when the envelope is subjected to pressure caused by its supporting the cushion on which the user sits.

In particular, this unit is different not only in size but in function because it is adapted to fit the seat of a chair having a donut-shaped preferably waterproof cushion 140 removably placed on the upper surface and the unit at least partially supports the user in a sitting position on the donut-shaped cushion. Extended use in a sitting position is therefore provided for a patient in a wheelchair or otherwise transported for extended viewing at an outdoor sporting event. Because of the larger size of the unit as compared to the ambulatory units shown in the previous Figures, this disposable unit 126 will meet an incontinent person's needs for an entire afternoon or more. Any of the male, female or unisex collecting means may be used with unit 126 simply by plugging into the barbed stub of interconnect 40. Regardless of which collector is used, the brief or panty-like garment must be provided with an opening commensurate with one of outlets 52, 70 or 88.

A third embodiment is seen in Figure 13 and 14. Catheter in the form of a panty-like brief being wearable by a user to provide support for a collecting means and having sufficient volumetric capacity for holding the fluid content of more than one full bladder urination. It is a liquid impervious envelope having an inner surface 144 and a spaced apart outer surface 146 meeting at peripheral edges 148 and 150 defining two leg holes separated by a crotch area 152. The inner surface 154 of crotch 152 has a fluid inlet 156

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which is connectable to interconnect means 40 for connecting a male, female or unisex collecting means in fluid communication. Figure 13 shows a female collecting device supported in the wearable catheter unit by the crotch area.

5 The envelope indicated generally as 158 also has waist opening 160 defined by perimeter edge 162. Preferably the perimeter edge 162 includes slits (not shown) to form air vents to allow air displaced by fluid entering the envelope to escape to the outside.

10 The envelope 158 is cut away in Figure 13 to show the coextensive layers of absorbent material 18 and superabsorbent polymer 82. As indicated, the absorbent material 18 should be adjacent the inside surface 144 especially at crotch area 152, so that it can perform its distributing  
15 function to distribute fluid to the superabsorbent polymer layer. The superabsorbent polymer may also include fibrous material in combination therewith. The absorbent material transports liquid by capillary action and the superabsorbent polymer fixes it as a gel in place upon contact. This unit  
20 is ideally suited to utilize absorbent material with superabsorbent polymer, to utilize the large volume between the inner and outer surfaces 144, 146 of envelope 158. The larger volume as compared to the other ambulatory units of Figures 1, 5 and 9 allows sufficient absorbent filler to  
25 absorb more than one full bladder urination. As much as two or three such urinations may be held to permit extended wear. The unit may be covered with an outer layer of fabric 164 and an inner layer of fabric 166 which may be joined together at the waist 168. Fabric layers 164, 166 may be of  
30 the nonwoven type. Inner fabric layer 166 may have slits to accommodate the T-shaped ends of unit 58 to help hold it.

A modification of the panty-like brief of Figure 13 is shown in Figure 14 designated generally as 142A. Figure  
35 14 has a liquid impervious envelope covered with a layer of fabric generally designated by the reference numeral 170. It has an outer surface panel 172 and an inner surface panel 174 which has a peripheral edge panel 176 which will form one leg opening and a peripheral edge panel 178 which will



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form the other leg opening. Peripheral edge 176 is overlapped at side overlap 180 and peripheral edge 178 is overlapped at side overlap 182. The overlap portions are held in place by Velcro tabs 182, 184 on one side and 186, 188 on the other side in a releaseable manner. When overlapped, upper surface panel 190 forms a waist opening 191. As before, the envelope 170 has coextensive absorbent material 18 and superabsorbent polymer layer 82 arranged as in Figure 13 with the superabsorbent polymer contained within the envelope adjacent outer surface panel 172 and the absorbent material in the envelope adjacent inner surface panel 174. This is so that waste fluid collected in female collector 58 passing through interconnect 40 and inlet 156 centered in the lowermost portion of the crotch area 192 first contacts the absorbent material upon entry to the envelope, which distributes the fluid to the underlying superabsorbent polymer which fixes it in a gel. The catheter unit 142A of Figure 14 comprises a liquid impervious envelope 170 covered all over with the layer of fabric for comfort. It has the advantage of being adaptable to a range of waist sizes to provide a better fit and is more easily put on and taken off.

Figure 16 illustrates the use of a vent in the impervious envelope. The catheter unit is generally designated by the reference numeral 194. Containment means 196 is almost identical to the unit shown in Figure 1. It has an upper surface panel 14, a lower surface panel 16 with side panel 20 and opposite side panel 22 together with necked end portion 28. The upper surface panel 14 may be covered by a fabric 30 bonded thereto. The upper and lower surface panels, together with the side edges 20, 22 and end 24 and the opposite end. The opposite end (26) is opened up to see the absorbent layer 18 and superabsorbent polymer layer 82. Together they form a liquid impervious envelope.

Inlet 198 is a right angle connector having a centralized opening in sealed liquid communication with the interior of the envelope located and centered in the upper surface 14 to which a male collector 44 is attached having

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outlet 52 releaseably connected to the right angled open end of inlet 198. Inlet 198 has a flange 200 sealed to the under surface of upper panel 14. Any of the male, female or unisex collectors can be releaseably connected to inlet 198.

5 The right angled terminal portion of 198 has a barbed connector portion. The flanged portion can be thought of as an inlet and the right angled extension as an interconnecting means combined in a single structure. Spaced apart from the inlet 198 is a vent 202 located in peripheral edge 24 which

10 may also be enhanced by stitching 204. This vent may be placed in a similar position spaced apart from the inlet on the catheter units of any of the other Figures when the superabsorbent polymer powder is employed as an underlayer 82 coextensive or partially coextensive with the envelope.

15 Fibrous absorbent fluff 18 lying above the superabsorbent polymer transmits the fluid laterally and downwardly where it instantly forms a gel which fixes it in place. Vent 202 or stitching 204 serve to permit displaced air from the interior of the impervious envelope to be exited outside the

20 unit. Because the waste fluid is fixed in a gel and the vent is spaced apart from the inlet, there is no danger of liquid waste fluid exiting the vent opening.

In operation the spaced apart panels of the impervious liquid holding envelope of the containment means

25 are made of a flexible heat sealable plastic and the fabric covering may be woven or non-woven. The female collector is preferably made of a silicone rubber which is soft and flexible but which holds its shape by resilient memory. Naturally, all of the materials in contact with fluid waste

30 are resistant to urine. The interconnect and one-way valves are made of any suitable plastic molding compound. Everything except the containment means is reusable. The containment means is discarded after disconnecting the interconnecting element from the inlet.

35 Use of the one-way valve is not really necessary when the containment envelope contains a layer of the superabsorbent polymer because the liquid which enters the envelope of a given unit is instantly converted to a non-

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flowable gel which cannot be forced back out of the inlet even under reasonable pressure. The one-way valve element is useful when the containment means has only absorbent fluff material because the fluid is held in the interstices of the fibers and when capacity is reached may be squeezed back out of the envelope if pressure is applied. Superabsorbent polymer by itself is not effective without the layer of absorbent fluff to disperse fluid to it. When the superabsorbent polymer powder is used the amount of absorbent material may be reduced by as much as 25 to 50 percent. While the absorbent fluff or pulp liquid on a weight to weight basis of about 8 to 1 the superabsorbent polymer absorbs on a weight basis of about 40 to 1 or more (liquid to absorbing material). An example is that 28 grams of fluff might be used with 2 grams of superabsorbent polymer. Depending on the physical size of the containment envelope, the relative amounts of absorbent fiber and polymer may have to be adjusted to achieve optimum liquid holding capacity. In terms of thickness the layer of superabsorbent polymer may be only about one fifteenth of the thickness of the absorbent pulp material. The superabsorbent polymer is preferably impregnated on thin fibrous tissue or between layers of such tissue to hold it and to help in transmission of the fluid throughout the polymer layer itself.

Some products in the mass consumer market in the U.S. which utilize superabsorbent polymer powder in diapers or incontinence devices include Kimberly Clark's tradenamed product "Depends" and another product by Principal Business Industries tradenamed "Tranquility." Proctor and Gamble has an incontinence diaper type product tradenamed "Attends", as well as the baby diaper using superabsorbent powders sold under the tradename "Ultra Pampers". Some of these utilize wood pulp impregnated with superabsorbent polymer which may also be used in the layer 82 of the present invention.

A large variety of suitable superabsorbent polymers are known and they have been the subject of many patents. The main characteristics for use in the present invention

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are low cost and high gel forming capacity as well as compatibility with urine for gel formation. Since they are entirely enclosed in the envelope of the present invention there need be no special concern about causing skin rashes as there is when superabsorbents are used in baby diapers. Some recent articles discussing superabsorbent polymers in periodicals distributed in the U.S. are: "Diaper Industry Responds to Superabsorbent Controversy" from Nonwovens Industry, January 1987; "Fluff Pulp vs. Superabsorbents" from Nonwoven Industry, October 1987; "Superabsorbent Patents" from Nonwoven Industry, November 1987; and, "Superabsorbent Polymers in the Japanese Market" from Nonwovens Industry, August 1988. The disclosure of these articles from Nonwoven Industry are incorporated herein by reference. Some of the commercially available powders or combinations of fibers and superabsorbent polymer suitable for use in the layer 82 of the present invention are specifically set forth in a table in the August 1988 article.

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CLAIMS

1. A compact catheter assembly for transferring fluid waste collecting in a users bladder to a disposable waste fluid holding unit proximately mountable adjacent the natural bladder discharge orifice comprising:

5 a means for collecting fluid waste from a user and delivering the collected fluid to an outlet;

a disposable sealed containment means adapted for holding a quantity of said fluid waste;

10 a means for interconnecting said outlet in sealed liquid communication with the containment means for delivering said fluid waste thereto; and,

absorbent means carried within the containment means for distributing and absorbing fluid waste delivered to the containment means through the interconnecting means.

2. The assembly of claim 1 wherein the sealed containment means is a generally rectangular shaped pad having a liquid impervious envelope, the envelope having spaced apart upper and lower surfaces to accommodate the absorbent means, the containment means including an inlet means capable of sealed engagement with said interconnecting means and having sufficient volumetric capacity to accept delivery of the contents of a full bladder urination.

3. The assembly of claim 2 wherein the absorbent means further comprises a layer of absorbent material substantially coextensive with the impervious envelope, positioned between the upper and lower surfaces of the envelope and having absorbency sufficient to absorb contents of a full bladder urination passing through the inlet.

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4. The assembly of claim 3 wherein the inlet means is mounted at the upper layer of the envelope, said inlet means and said interconnecting means being releasably engageable in sealed fluid communication.

5. The assembly of claim 4 wherein the absorbent material is a combination of absorbent tissue and gel forming polymer powder which forms a gel upon contact with waste fluid.

6. The assembly of claim 5 wherein the collecting means is a thin flexible condom-like sheath tube removeably fittable on a male member to form a seal therewith, tapering to form said outlet.

7. The assembly of claim 6 wherein the interconnect means removeably extends in fluid tight communication between said inlet and outlet and further includes means for venting air.

8. The assembly of claim 6 wherein the envelope has means for venting air from the sealed containment means, spaced apart from said inlet.

9. The assembly of claims 4, 7 or 8 further including a one-way flow valve comprising a spring set cylindrical valve carried by the interconnect means.

10. The assembly of claims 4, 7 or 8 further including a one-way flow valve comprising a reed valve which is carried by the interconnect means to permit liquid flow within the interconnect means in only one direction.

11. The assembly of claims 4, 7 or 8 further including a one-way valve comprising a spring loaded ball valve carried by the interconnect means to permit liquid flow to the containment means through the inlet.

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12. The assembly of claim 5 wherein the collecting means is an elongated resiliently deformable body having a cover panel with centralized elongate opening for the female urethra, said body having a resilient non-absorbent insert spaced apart below the cover panel, and being resiliently deformable along with said catheter body, said body tapering to form said outlet spaced below said cover panel.

13. The assembly of claim 12 wherein the interconnect means removeably extends in fluid tight communication between said inlet and outlet and further includes means for venting air.

14. The assembly of claim 12 wherein the envelope has means for venting air from the sealed containment means, spaced apart from said inlet.

15. The assembly of claims 12, 13 or 14 further including a one-way flow valve comprising a spring set cylindrical valve carried by the interconnect means.

16. The assembly of claims 12, 13 or 14 further including a one-way flow valve comprising a reed valve which is carried by the interconnect means to permit liquid flow within the interconnect means in only one direction.

17. The assembly of claims 12, 13 or 14 further including a one-way valve comprising spring loaded ball valve by the interconnect means to permit liquid flow to the containment means through the inlet.

18. The assembly of claim 5 wherein the collecting means is a Foley catheter.

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19. The assembly of claim 18 wherein the interconnect means removeably extends in fluid tight communication between said inlet and outlet and further includes means for venting air.

20. The assembly of claim 18 wherein the envelope has means for venting air from the sealed containment, means spaced apart from said inlet.

21. The assembly of claims 18, 19 or 20 further including a one-way flow valve comprising a spring set cylindrical valve carried by the interconnect means.

22. The assembly of claims 18, 19 or 20 further including a one-way flow valve comprising a reed valve which is carried by the interconnect means to permit liquid flow within the interconnect means in only one direction.

23. The assembly of claims 18, 19 or 20 further including a one-way valve is comprising spring loaded ball valve carried by the interconnect means to permit liquid flow to the containment means through the inlet.

24. The assembly of claim 4 wherein the absorbent means is a fibrous material and includes a layer of polymer powder which forms a gel upon contact with waste fluid.

25. The assembly of claim 24 wherein the collecting means is a thin flexible condom-like sheath tube removeably fittable on a male member to form a seal therewith, tapering to form said outlet.



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26. The assembly of claim 24 wherein the collecting means is an elongated resiliently deformable body having a cover panel with centralized elongate opening for the female urethra, said body having a resilient non-absorbent insert spaced apart below the cover panel, and  
5 being resiliently deformable along with said catheter body, said body tapering to form said outlet spaced below said cover panel.

27. The assembly of claim 24 wherein the collecting means is a Foley catheter.

28. The assembly of claim 25 wherein the interconnect means removeably extends in fluid tight communication between said inlet and outlet and further includes means for venting air.

29. The assembly of claim 25 wherein the envelope has means for venting air from the sealed containment means, spaced apart from said inlet.

30. The assembly of claim 27 wherein the interconnect means removeably extends in fluid tight communication between said inlet and outlet and further includes means for venting air.

31. The assembly of claim 27 wherein the envelope has means for venting air from the sealed containment means, spaced apart from said inlet.

32. The assembly of claim 26 wherein the interconnect means removeably extends in fluid tight communication between said inlet and outlet and further includes means for venting air.

33. The assembly of claim 26 wherein the envelope has means for venting air from the sealed containment means spaced apart from said inlet.

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34. A compact catheter assembly for extended use in a sitting position to transfer fluid waste collecting in a users bladder to a disposable waste fluid holding unit positionable on a surface in at least partial support of said user comprising:

a means for collecting fluid waste from the urethra and delivering the collected fluid to an outlet;

a disposable sealed containment means of sufficient volumetric capacity for holding the fluid content of more than one full bladder urination;

means for interconnecting said outlet in sealed liquid communication with the containment means; and,

absorbent means carried within the containment means for distributing and absorbing fluid waste delivered to the containment means through the interconnecting means.

35. The assembly of claim 34 wherein the containment means is a pad having a liquid impervious envelope, the envelope having a generally centrally located fluid inlet capable of releasable sealed engagement with said interconnecting means, the upper and lower surfaces meeting at a periferal edge adapted in size to fit on the seat of a chair.

36. The assembly of claim 35 wherein the absorbent means further includes a layer of absorbent material substantially coextensive with the impervious envelope, positioned between the upper and lower surfaces of the envelope and having absorbency sufficient to absorb contents of more than one full bladder urination passing through the inlet.

37. The assembly of claim 36 wherein the absorbent material is a combination of absorbent tissue and gel forming polymer powder which forms a gel upon contact with waste fluid.

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38. The assembly of claim 36 or 37 wherein the interconnecting means carries a one-way flow valve for controlling flow of waste fluid into said containment means by accepting incoming waste fluid but preventing outflow of said fluid from the containment means.

39. The assembly of claim 38 wherein the one-way flow valve is selected from the group consisting of a reed valve, a cylindrical valve or a ball valve.

40. The assembly of claim 37 wherein the collecting means is a thin flexible condom-like sheath tube removeably fittable on a male member to form a seal therewith, tapering to form said outlet.

41. The assembly of claim 37 wherein the collecting means is an elongated resiliently deformable body having a cover panel with centralized elongate opening for the female urethra, said body having a resilient non-absorbent insert spaced apart below the cover panel, and being resiliently deformable along with said catheter body, said body tapering to form said outlet spaced below said cover panel.

42. The assembly of claim 37 wherein the collecting means is a Foley catheter.

43. The assembly of claim 40 wherein the envelope has means for venting air from the sealed containment means, spaced apart from said inlet.

44. The assembly of claim 41 wherein the envelope has means for venting air from the sealed containment means, spaced apart from said inlet.

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45. The assembly of claim 42 wherein the envelope has means for venting air from the sealed containment means, spaced apart from said inlet.

46. A compact catheter assembly for transferring fluid waste collecting in a users bladder to a wearable waste fluid holding unit shaped like a panty or brief comprising:

5           a means for collecting fluid waste from the urethra and delivering the collected fluid to an outlet;

          a disposable sealed containment means shaped in the form of a panty-like brief being wearable by a user to provide support for said collecting means and having sufficient  
10       volumetric capacity for holding the fluid content of more than one full bladder urination;

          means for interconnecting said outlet in sealed liquid communication with the containment means; and,

          absorbent means carried within the containment  
15       means for distributing and absorbing fluid waste delivered to the containment means through the interconnecting means.

47. The assembly of claim 46 wherein the containment means has a liquid impervious envelope having an inner surface for contact with a users body and a spaced apart outer surface, the surfaces meeting at periferal edges  
5       defining two leg holes separated by a crotch area and a waist opening, said inner surface of the defined crotch area having a fluid inlet capable of releasable sealed engagement in fluid communication with said interconnecting means.

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48. The assembly of claim 47 wherein the absorbent means further includes a layer of absorbent material substantially coextensive with the impervious envelope, positioned between said inner and outer surfaces of the envelope and having absorbency sufficient to absorb contents of more than one full bladder urination passing through the inlet.

49. The assembly of claim 48 wherein the absorbent material is a combination of absorbent tissue and gel forming polymer powder which forms a gel upon contact with waste fluid.

50. The assembly of claim 48 or 49 wherein the interconnecting means carries a one-way flow valve for controlling flow of waste fluid into said containment means by accepting incoming waste fluid but preventing outflow from the containment means.

51. The assembly of claim 50 wherein the one-way flow valve is selected from the group consisting of a reed valve, a cylindrical valve or a ball valve.

52. The assembly of claim 48 or 49 wherein the collecting means is a thin flexible condom-like sheath tube removeably fittable on a male member to form a seal therewith, tapering to form said outlet.

53. The assembly of claim 48 or 49 wherein the collecting means is an elongated resiliently deformable body having a cover panel with centralized elongate opening for the female urethra, said body having a resilient non-absorbent insert spaced apart below the cover panel, and being resiliently deformable along with said catheter body, said body tapering to form said outlet spaced below said cover panel.

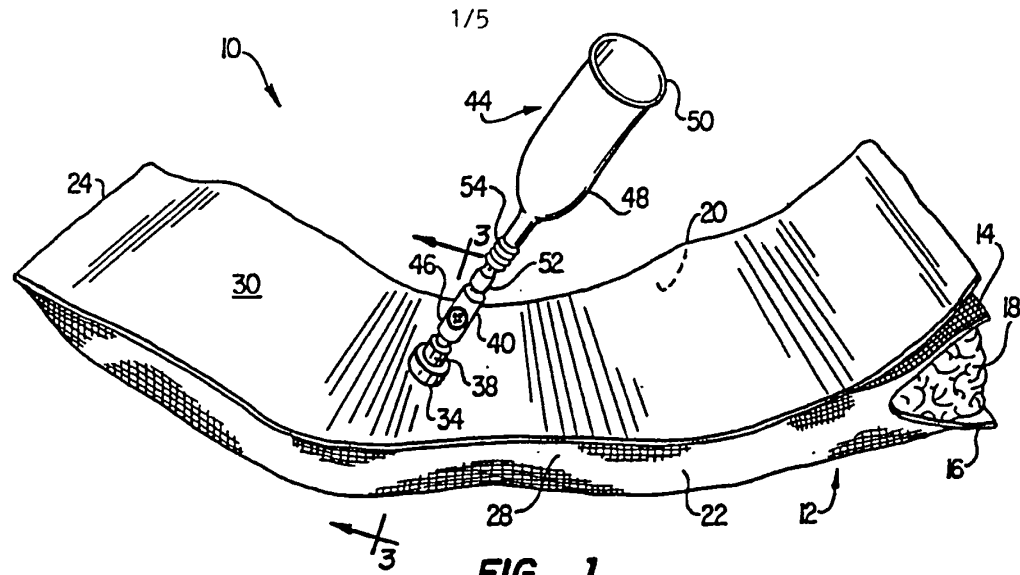
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54. The assembly of claim 48 or 49 wherein the collecting means is a Foley catheter.

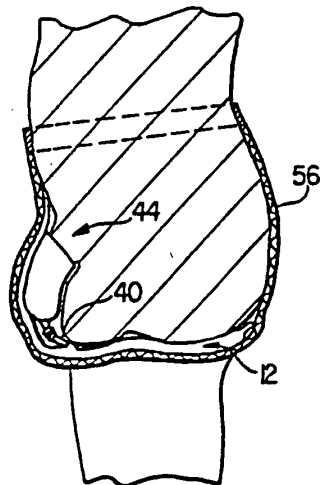
55. The assembly of claim 52 wherein the envelope has means for venting air from the sealed containment means, spaced apart from said inlet.

56. The assembly of claim 53 wherein the envelope has means for venting air from the sealed containment means, spaced apart from said inlet.

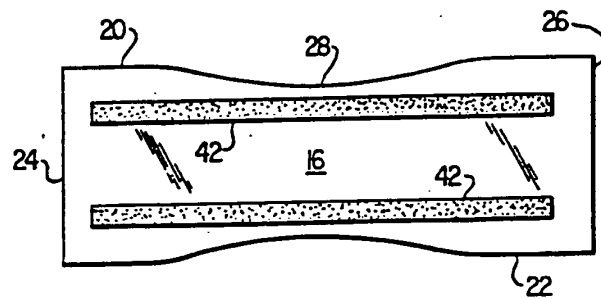
57. The assembly of claim 54 wherein the envelope has means for venting air from the sealed containment means, spaced apart from said inlet.



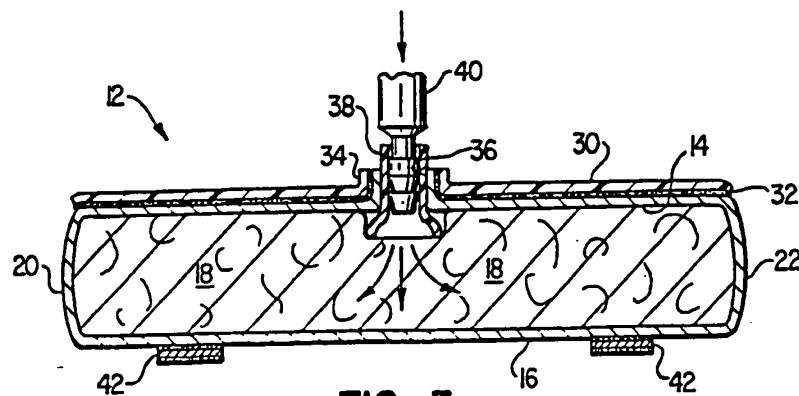
**FIG. 1**



**FIG. 2**



**FIG. 4**



**FIG. 3**

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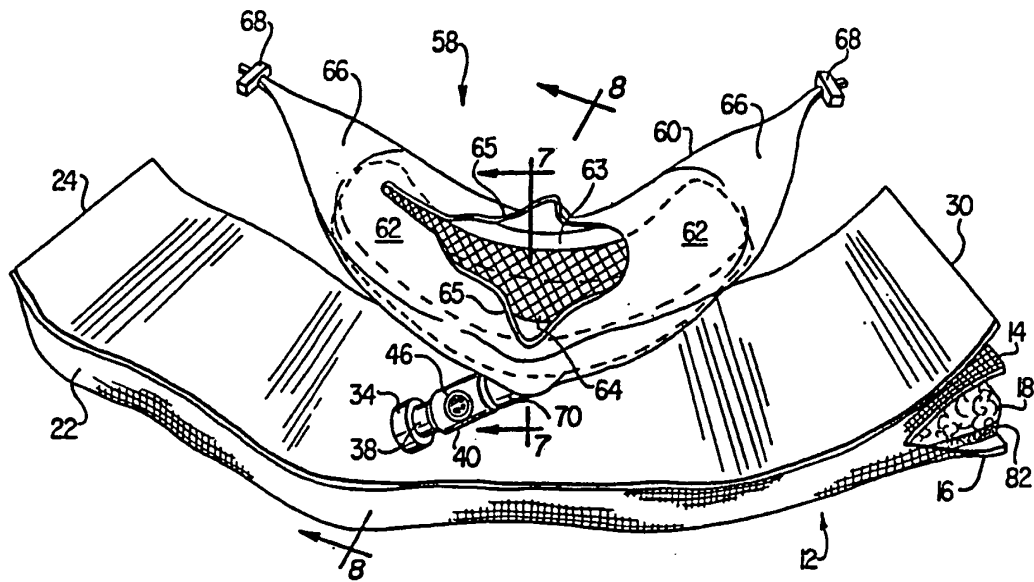


FIG. 5

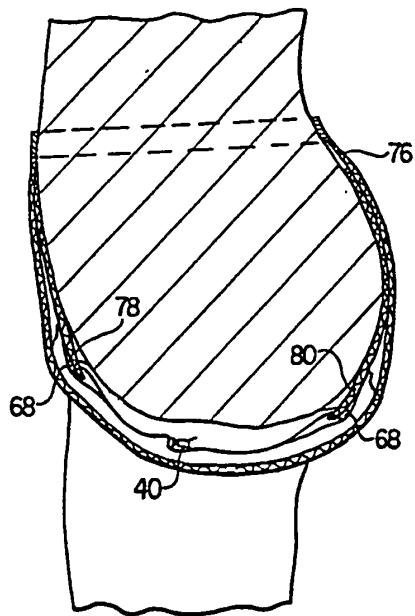


FIG. 6

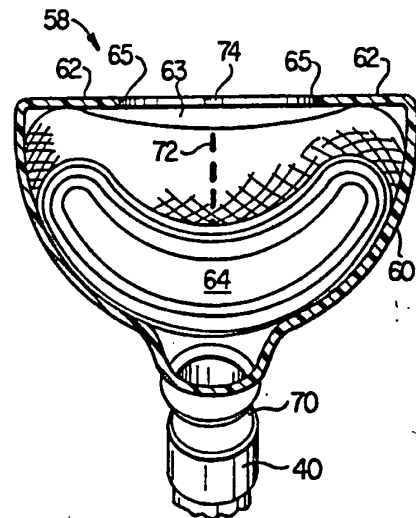


FIG. 7



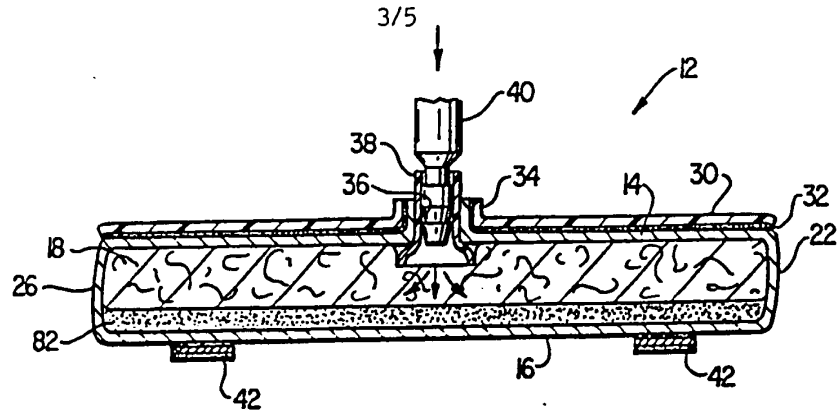


FIG. 8

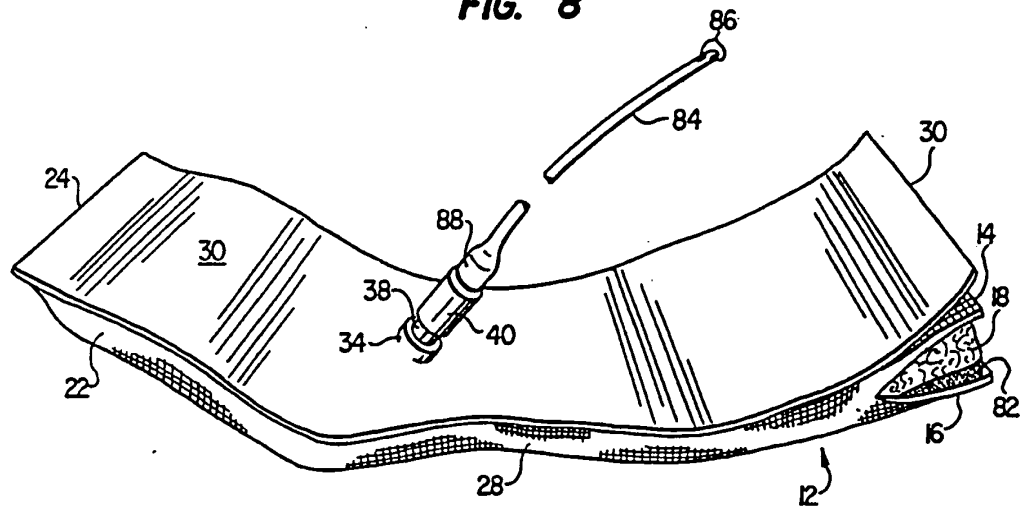


FIG. 9

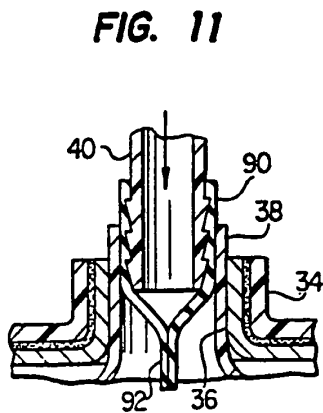


FIG. 11

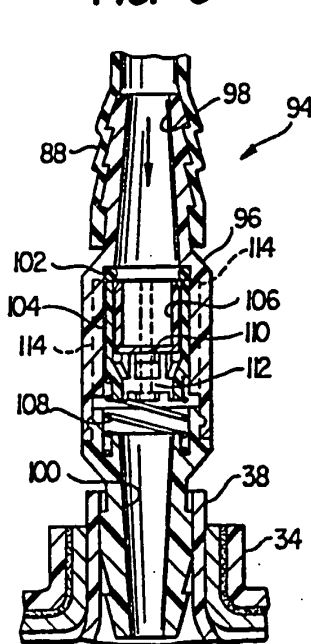


FIG. 10

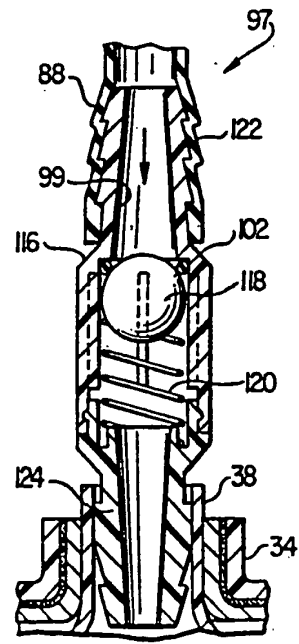


FIG. 12

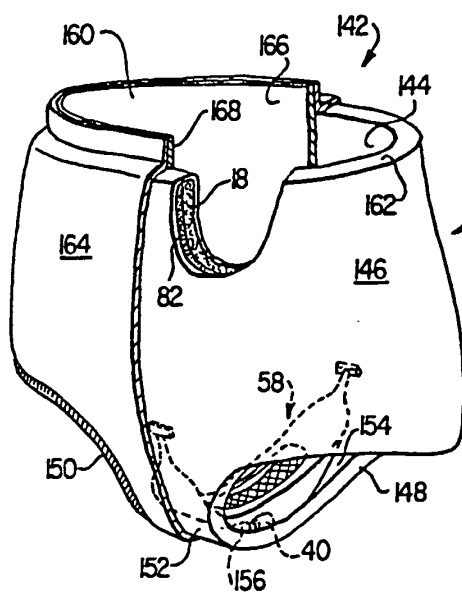


FIG. 13

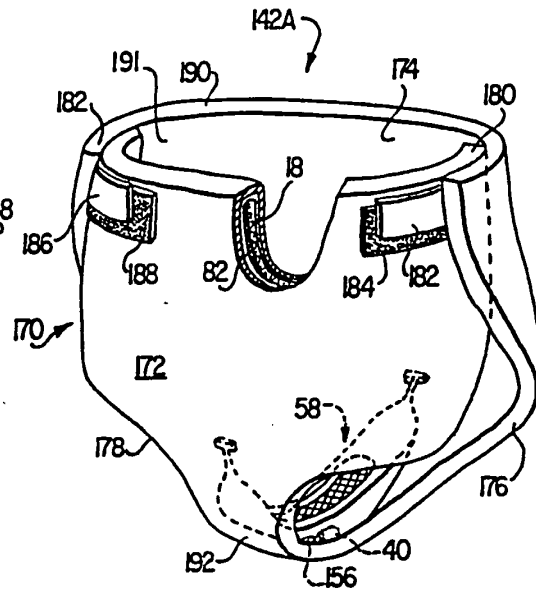


FIG. 14

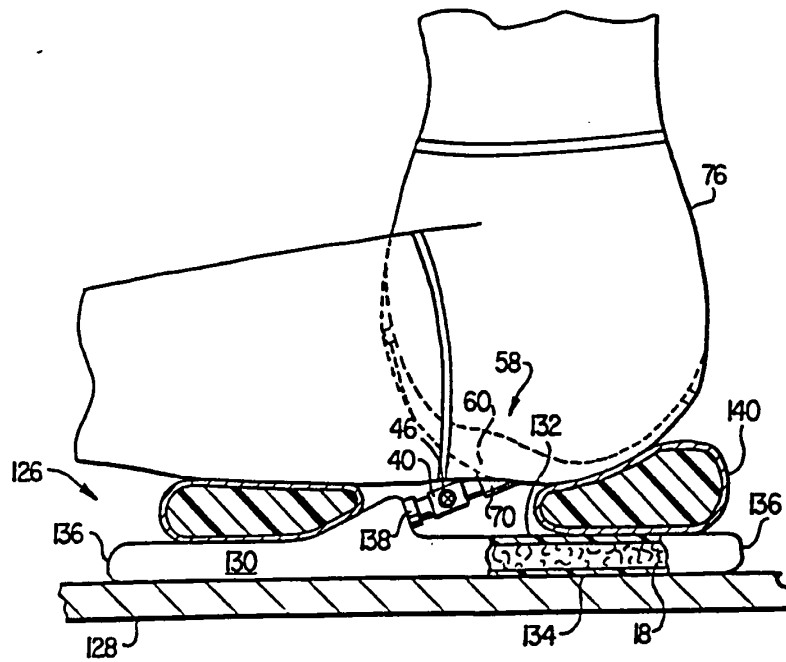
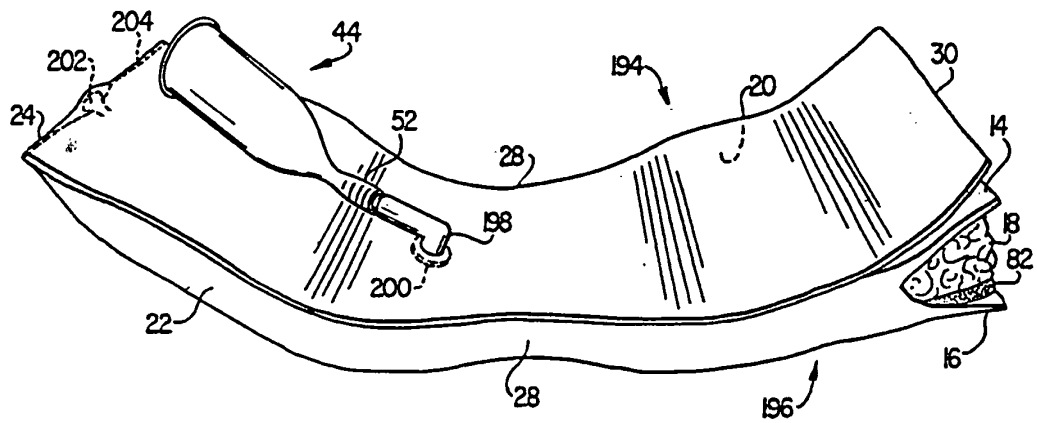


FIG. 15

**FIG. 16**